

Network Slicing Use Cases Requirements

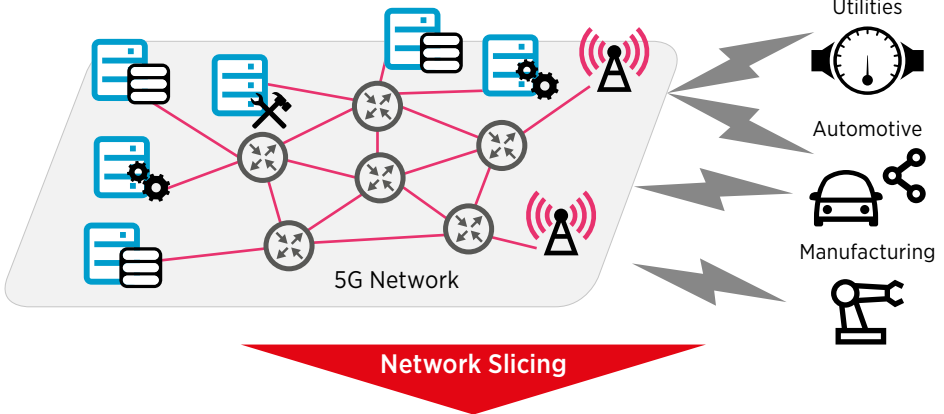
5G networks, in combination with Network Slicing, permit business customers to enjoy connectivity and data processing tailored to their specific business requirements. Mobile communications provided by smart networks will enhance the efficiency and productivity of business processes and create more opportunities for operators to address Business to Business segments.

A smart 5G network

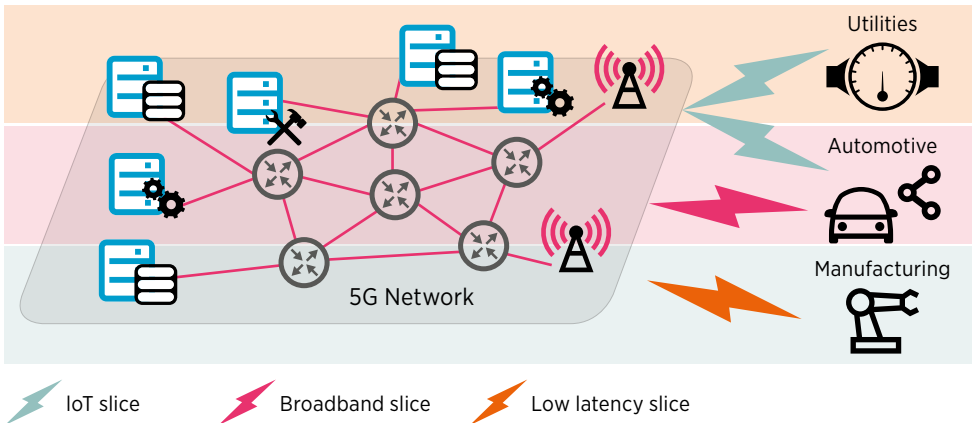
From a technical point of view, a network slice is an independent end-to-end logical network that runs on a shared physical infrastructure, capable of providing an agreed, negotiated service quality. Network Slicing is a technical mechanism that permits network operators to efficiently offer customised services with reduced time to market.

However, it can be argued that the main beneficiaries of Network Slicing are in fact business customers who can, thanks to this technology, enjoy connectivity and data processing tailored to their specific business requirements. The customisable network capabilities include data speed, quality, latency, reliability, security as well as many other aspects. These capabilities are always provided based on a Service Level Agreement (SLA) between the mobile operator and the business customer.

5G networks need to serve customers with very different needs



5G networks subdivided into virtual networks each optimised for one business case



Ultimately operators can package the advanced capabilities of 5G and the configurability of Network Slicing to provide customers with a smart network.

With the release of the 3GPP 5G New Radio specification (Release 15), it is anticipated that operators will start to commercially deploy 5G in 2019/20 as well as some elements of slicing during this time. 3GPP's next 5G specification (Release 16) will contain enhanced capabilities that facilitate more automation of slicing. It is currently anticipated that the full range of slicing will be available around 2022. While this may seem some distance away, business users and operators will need time to learn how to best deploy and operate slicing. In order for this technology to be effective, customer propositions must be constructed and the appropriate business models evolved.

The business opportunity size

In the 5G era, different industry verticals are seeking to leverage the power of technology to boost productivity across swathes of the economy. Network Slicing builds on this expectation and together with the promise of massive IoT and ultra-reliable/low latency services will support digital transformation and mobilisation of industry vertical customers.

However, the opportunity could be expanded even more. Automation and the ability to customise the attributes of the mobile service will pave the way for operators to dynamically package and repackage network capabilities for different customers, in almost real time.

The GSMA estimates that in combination with other enablers and capabilities, Network Slicing will permit operators to address a revenue opportunity worth \$300bn by 2025.

The GSMA is working with their members to streamline the commercial deployment scenario for Network Slicing in order to drive economies of scale and reduce the unitary cost of deployment. At the same time, operators and their vendors are working hard to make the cost of deploying Network Slicing marginal to the broader investment case for 5G. This is an important consideration because, as the lesson of LTE and VoLTE showed, building a new investment case to retrofit an already deployed network is both difficult and slow.











Understanding the customers' needs

The possibility of tailoring the mobile network properties to the needs of businesses through the configuration of a large set of parameters offers unsurpassed flexibility. However, the requirements of verticals are many and diverse, and operators would need to manage a high level of risk in the complexity of their service offering and cumbersome management, driving up costs.



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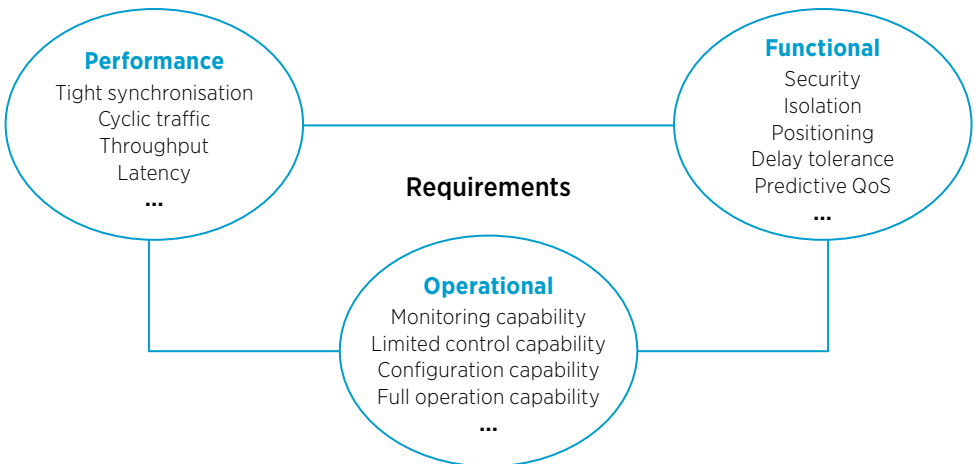
To address this potential early deployment issue, the GSMA has set out to understand the service requirements expressed by business customers within different vertical industries. Through a combination of online questionnaires, interviews and desk research, this GSMA project has gathered information about a large body of use cases in key vertical sectors.

 AR/VR	 Government
 Automotive	 Utilities
 Logistic	 Media & Entertainment
 Industrial Internet	 Financial
 Health & Wellness	 Smart Cities

Vertical sectors considered during use case collection

Requirements for each use case was analysed, quantified where possible and categorised into performance requirements, functional requirements and operational requirements. This study has also been used to identify the use cases that can be served by the same network slice type as well as use cases that are likely to require simultaneous support, something we refer to as network slice bundles. A network slice bundle describes the family of network slice types required to serve a group of use cases, for example a network slice bundle for a vehicle will include slices supporting; a high-reliability telemetry service, a high bandwidth infotainment service, a low latency “vehicle to network to X” service, a super low latency vehicle to vehicle, etc..

Leveraging on the categorisation of attributes that define a network slice, the GSMA has also been working on defining a generic slice template. A generic slice template would provide a universal description of a network slice type that could be used by infrastructure vendors, mobile operators and slice buyers.



When populated with values for all or a subset of the attributes, the generic slice descriptor can serve many purposes:

- Infrastructure vendors can use the descriptor to define the service features of their slice
- The slice buyer can use the descriptor as a reference for SLA/contractual agreements with the operator
- Operators can exchange slice descriptors with their roaming partners facilitating the support of service continuity when moving between networks

The generic slice template will also serve as the baseline for defining a set of standardised service/slice types.

Summary

It is anticipated that through Network Slicing, mobile network operators will create a win-win situation where the network is used more efficiently and customers obtain the performance, functionality and operational control they require to serve their use cases.

It is estimated that the use of 5G mobile technology in industry sectors that could not be addressed by 4G will be unlocked by 2025, with a targetable revenue opportunity in the region of \$300bn globally.

The flexibility offered by Network Slicing is unprecedented: operators will be able to deploy a single network slice type that satisfies the needs of multiple verticals, where the business case allows a bespoke network slice for

a single customer, as well as multiple network slices of different types that are packaged as a single product. Especially in the early phases of the deployment, it pays to carefully manage such flexibility and this can be done by globally adopting a basic set of standardised network slices that address the majority of the use cases.

A common method of describing the attributes of a network slice should also be defined and the GSMA is proposing to adopt a set of “generic slice templates”.

Acknowledgments and Information

The content of this booklet is derived from the “Network Slicing Use Case Requirements” report produced by the GSMA Network Slicing Taskforce that will be published in March 2018. Besides covering the topics presented in this booklet in a much greater detail, the report provides an overview of vertical organisations, standards developing bodies and industry consortia working on Network Slicing and their interactions; regulatory aspects that may impact the deployment and operation of Network Slicing; a set of industry recommendations. The report also sets out the goals for future work on Network Slicing within the GSMA.

To be the first to receive the report when it is published or to get involved in shaping the development of Network Slicing, please contact 5Gnetworks@gsma.com



The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai, Mobile World Congress Americas and the Mobile 360 Series of conferences.

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